Grade 9 Math ***UNIT 2: Powers and Exponent Laws - TEST*** **Name:** SAMPLE

Part 1: Multiple Choice. **7 marks** **____ / 34 = ____ %**

Place the letter of the correct response in the space provided on the right.

1. Write $(-8)^6 \div (-8)^3$ as a single power. 1. B

(A) $(-8)^2$ (B) $(-8)^3$ (C) $(-8)^9$ (D) $(-8)^{18}$

2. Write $(7^3)^2 \times (7)^4$ as a single power. 2. C

(A) 7^2 (B) 7^9 (C) 7^{10} (D) 7^{13}

3. Evaluate: $3^3 - 4^2$ 3. D

(A) -11 (B) 1 (C) 7 (D) 11

4. Evaluate: $-4^2 + 7^0$ 4. A

(A) -15 (B) -9 (C) 17 (D) 23

5. Which has an answer of 16? 5. C

(A) 4^4 (B) -4^2 (C) $(-4)^2$ (D) $-(-4)^2$

6. Evaluate: $\left(\frac{2}{3}\right)^3$ 6. C

(A) $\frac{2}{27}$ (B) $\frac{6}{9}$ (C) $\frac{8}{27}$ (D) $\frac{8}{9}$

7. Which statement is true? 7. D

(A) $(4^6)^3 = 4^9$ (B) $4^6 \times 4^3 = 7^{18}$

(C) $4^0 = 0$ (D) $\frac{4^6}{4^3} = 4^3$

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***Part 2: Long Answer Questions.* 27 marks**

Answer ALL questions in the space provided. Show ALL working to receive FULL credit.

1. Complete the table. ___ / 4

Power	Base	Exponent	Repeated Multiplication	Standard Form
-4^6	4	6	-(4 x 4 x 4 x 4 x 4 x 4)	-4096
$\left(-\frac{5}{3}\right)^4$	$-\frac{5}{3}$	4	$-\frac{5}{3}\cdot-\frac{5}{3}\cdot-\frac{5}{3}\cdot-\frac{5}{3}$	$\frac{625}{81}$

2. Evaluate $(2^3)^2$ and $(2^3)(2^2)$ and explain why they are different. ___ / 4

$=2^6$ $=2^5$

$=64$ $=32$

$(2^3)^2$ means $2^3 \cdot 2^3 = 2^6$ or 64

$(2^3)(2^2)$ means $(2\cdot2\cdot2)(2\cdot2) = 2^5$ or 32

3. Evaluate each expression. Show your work. ___ / 6

a. $\left[(4-10)^3 \times 3^5\right]^0 + (6-2^2)$

$1 + (6-4)$

$1 + 2$

3

b. $(4-16\div2^3)^4 - (6-3)^2$

$(4-16\div8)^4 - (3)^2$

$(4-2)^4 - 9$

$2^4 - 9$

$16 - 9$

7

4. Write as a single power and then evaluate. ___ / 6

a. $(5^2 \times 5^8) \div (5^3)^2$

$5^{10} \div 5^6$

5^4

625

b. $\dfrac{(-3)^7}{(-3)^2 \times (-3)^3}$

$\dfrac{(-3)^7}{(-3)^5}$

$(-3)^2$

9

5. Using laws of exponents, simplify and then evaluate: ___ / 4

$(3^3 \times 3)^2 + [(-2)^5 \div (-2)^2]^3$

$(3^4)^2 + [(-2)^3]^3$

$3^8 + (-2)^9$

$6561 + (-512)$

6049

6. Identify and then correct any errors in the student's work below. Explain how you think the errors occurred. ___ / 3

$(3^3 + 3^2)^2$

$= (3^5)^2$ There is no rule for adding powers

$= 3^{10}$

$= 59049$

$(3^3 + 3^2)^2$

$(27 + 9)^2$

36^2

1296